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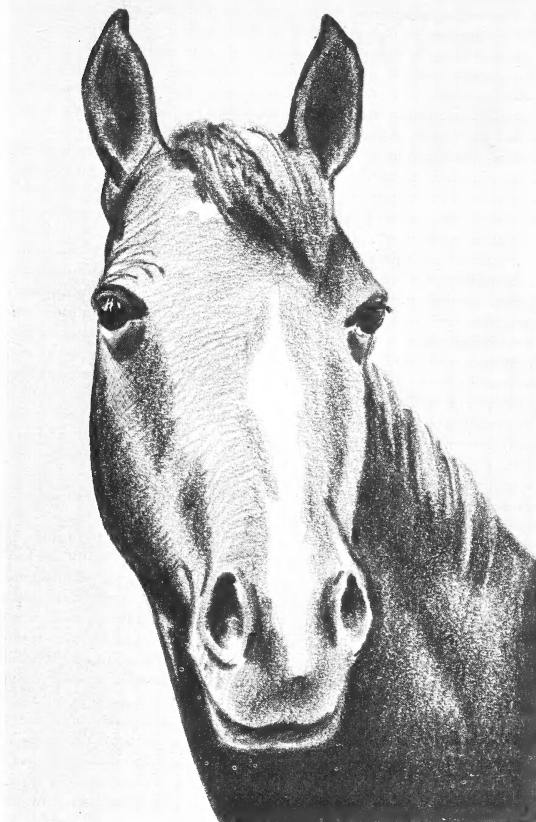
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# HORSE BOTS

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## HOW TO CONTROL THEM



LEAFLET NO. 450  
U.S. DEPARTMENT OF AGRICULTURE

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Prevention and treatment of the disorders caused by horse bots concern thousands of horse owners in this country. In 1970, the total horse population in the United States was approximately 7,000,000 animals. Of this number, about 2,739,500 were farm horses and mules; and about 4,260,500 were nonfarm or light horses.

Although the number of draft animals has declined steadily since the advent of the tractor, maintaining the health of draft animals still in use is vital in many areas. And the increasing popularity of light horses has created new demands for information about horse health.

To meet the needs of horsemen for help in controlling horse bots, the U.S. Department of Agriculture publishes this leaflet.

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This edition replaces all previous editions of this publication. Because of changed insecticide recommendations, earlier copies should be destroyed.

# HORSE BOTS

## How To Control Them

Three species of horse bot flies are serious pests in this country.

The common bot fly and the throat bot fly occur throughout the United States. The nose bot fly is found in Northwestern and Midwestern States.

Bot flies can be controlled by treating infested animals to destroy larvae and eggs.

### HOW BOT FLIES LIVE

Bot flies have four life stages—adult, egg, larva (bot), and pupa. These stages are described on this page and on pages 4 and 5.

Adult flies do not feed. Their sole purpose in life is to reproduce. They live from a few days to 3 weeks.

In Northern States, flies appear about the middle of June; they live until there is a heavy freeze. In Southern States, they appear as early as March and may be seen until December.

Eggs usually can be found on horses as soon as flies are seen. Egg laying continues as long as adults are present. Eggs of the common bot fly that can hatch may be found on the animals as late as December in Northern States, and as late as February in Southern States.

During the larval stage, the bots develop inside the animal; they

grow from minute size to about two-thirds of an inch in length. The exact nature of the food they take is not known, but bots feed on body fluids.

Mature bots may be found in the digestive tracts of horses and other equines at any time of the year, but they usually pass out of the animals by October. Practically all the bots found in animals during the early part of the winter are young.

When fully developed, bots pass out of the animal to the ground, where they seek protection. They crawl very little. Usually they burrow into the ground near the place where they were dropped. They burrow only deep enough to escape the direct rays of the sun.

### COMPARISON OF THE THREE SPECIES

#### Common Bot Fly

(*Gasterophilus intestinalis*)

*Adult.*—Largest of the three species; about the size of a honey bee. Body is covered with black and yellow hair. Wings are mottled.

Female hovers about animal; darts from place to place as she cements egg after egg to hairs on the forelegs (a favorite place), the

mane, the shoulders, the belly, the neck, and the flanks. Fly takes but a second to attach each egg. Several eggs may be fastened to the same hair; many may be attached to the mane and flanks.

One female can lay 500 eggs.

*Egg.*—Yellow. Ready to hatch in about 7 days. Eggs hatch any time (within 2 or 3 months). The animal licks or bites itself at the spot where eggs are attached; heat and moisture from the animal's mouth stimulate hatching.

*Larva.*—Newly hatched larvae are taken into animal's mouth when it licks or bites itself. Larvae burrow into tongue. They continue to burrow for 3 to 4 weeks, then pass into the animal's stomach, attach themselves, and remain until mature. The total period for larval development is 10 to 11 months.

Mature larvae pass out of animal with feces.

## Throat Bot Fly

(*Gasterophilus nasalis*)

*Adult.*—Smaller than common bot fly and more rapid in flight. Wings have no markings.

Female poises in midair, usually near the animal's forelegs, then darts at the animal to attach eggs on hair under the jaws; cements one to four eggs to a hair during each attack, flies away after each attack; returns in a few minutes.

One female can lay 500 eggs.

*Egg.*—Yellowish. Hatches in about 6 days. Does not require moisture or friction for hatching.

*Larva.*—Newly hatched larvae crawl into animal's mouth. Usually

*Pupa.*—Similar for all three species. The pupal stage begins 1 to 4 days after the bots burrow into the ground. The outer skin of the larva hardens to form a protective coating—the pupal case—this case is brown or black. The bot changes into a fly within the pupal case. At the end of the pupal period, which ranges from 15 to 70 days, the fly emerges from the pupal case and mates. Another life cycle begins.

they lodge in the pockets between the molars.

In 20 to 30 days larvae pass from the mouth into the stomach, then into the forward end of the small intestine, where they attach and remain until mature. The total period for larval development is 10 to 11 months.

Mature larvae pass out of animal with feces.

## Nose Bot Fly

(*Gasterophilus haemorrhoidalis*)

*Adult.*—Smallest of bot flies; most rapid in flight. Most hairs on body are dark. Wings have no markings.

Female darts at the lips of the animal; deposits one egg at the base of the hair, then darts away. A few seconds later she strikes again. Eggs are deposited close to the skin, usually along the front of the upper and lower lips.

One female can lay 160 eggs.

*Egg.*—Black. Hatches in about 2 days. Moisture is necessary for

hatching, but apparently friction is not required.

*Larva.*—Newly hatched larvae burrow through the lips to the inside of the lips just in front of the teeth. Here they remain for 6 weeks or more.

Larvae then pass to various parts of the stomach, and attach themselves to the lining. The greatest number attach near the stomach exit.

Mature larvae release their attachment in the stomach, pass to the rectum, and attach again. They remain here 2 or 3 days, then release their attachment and drop to the ground. The total period for larval development is similar to that for the other two species (10 to 11 months).

## DAMAGE

Horse bot flies damage animals indirectly and directly.

Animals under attack may inflict damage on themselves or on anyone trying to handle them. Fright and irritation caused by egg-laying adults or newly hatched bots may result in animals going out of control.

Direct damage is produced by larvae feeding on the tissues of the animal.

### Indirect Damage

*By flies.*—Animals fear the flies and are annoyed by them. The common bot fly is the least annoying of the three species, probably because it does not fly toward the animal's head as do the throat and nose bot flies.

On warm, sunny days, when bot flies are most numerous, horses and mules on pasture fight the flies from morning until late afternoon. They walk about trying to get rid of the flies, constantly bobbing their heads as they walk. If this fails to prevent attack, they run. They may gather in the shade on high ground when the wind blows, or they may enter barns or other shelters. Colts which are heavily attacked may lie down near the older animals.

While the horses are fighting the flies, they are unable to graze; after days of bot fly attack, they may lose weight and suffer from lack of proper nourishment.

Men who go near horses being attacked by flies may be injured severely. Horses attacked in harness or when saddled often become uncontrollable. Runaways commonly result.

*By larvae.*—Newly hatched bots produce a severe irritation as they burrow into the animal's tongue, gums, or lips. The irritation and itching caused by the young nose bots is particularly severe.

To relieve the irritation, animals may stand at watering troughs, dip their lips into water, and rub their lips violently against the wall of the tank. They may injure themselves by rubbing their lips and noses on the ground, fences, stones, or other objects.

### Direct Damage

The bots attach themselves with spiny mouth hooks to the lining of the animal's stomach or small intestine. These attachments cause in-

flammation, which interferes with digestion.

Bots attached to the lower part of the stomach interfere with the passage of food. Infested animals often suffer from colic or other gastric disturbances.

The degree of damage done by the feeding of the larvae is roughly in proportion to the number present. Several hundred larvae may be found in one animal; more than 1,000 have been found in the stomach of a colt.

## CONTROL

### Internal Treatment

Two insecticides are available for the control of horse bots. Trichlorfon may be administered by horse owners or veterinarians. The other insecticide, carbon disulfide, has been in use for many years. **Although very effective, carbon disulfide is considered hazardous and should be administered only by veterinarians.** Instructions on the use of these materials are given below.

**Trichlorfon.**—This insecticide may be administered in feed, in a gelatin capsule, as a drench, or by stomach tube. The rate of administration should not exceed 1.8 grams per 100 pounds of body weight or approximately 40 milligrams per kilogram. Thoroughbreds and other sensitive horses should be given 1.2 grams per 100 pounds or 25 milligrams per kilogram. A close approximation of each animal's weight should be made. The required dose may be calculated and packaged separately before administration.

The easiest way to give trichlorfon is in feed. The required dosage may be used dry or dissolved in one to two cups of water and mixed thoroughly with a normal feed ration. Animals should not be fed for 12 to 18 hours before treatment so that they will be hungry enough to completely consume the treated ration. No other feed should be provided until the treated ration has been consumed. Some horses not accustomed to eating oats or commercial feeds, may refuse trichlorfon-treated feed. They must be given the chemical in a capsule or as a drench.

A drench can be prepared by dissolving the proper dosage of trichlorfon in  $\frac{1}{2}$  to 1 pint of warm water. This solution may be given orally or by stomach tube.

Trichlorfon may be given in a gelatin capsule. The required dosage should be placed in the capsule and administered with a balling gun.

Some horses may show signs of colic for a short time after receiving treatment. If the colic is severe, a veterinarian should administer atropine sulfate.

Trichlorfon treatments should not be given for at least 1 and preferably 2 months after the first killing frost. The best time for treatment varies with location but is ordinarily from November through January, a period when all species of bots are concentrated in the stomach and intestines. Trichlorfon will kill the bots and they will pass out in the manure. One treatment a year is sufficient to control horse bots.

Do not treat sick or debilitated horses, colts under 4 months of age,



or mares in the last month of pregnancy.

Do not exceed the recommended dose.

Study the product label. Carefully follow the directions and heed all precautions on the label.

**Carbon disulfide.**—This insecticide is introduced directly into the stomach of the animal. It acts as a fumigant, causing the bots to release their hold on the walls of the stomach and intestines. *If administered improperly*, it can kill the animal.

Steps in obtaining and administering the treatment are:

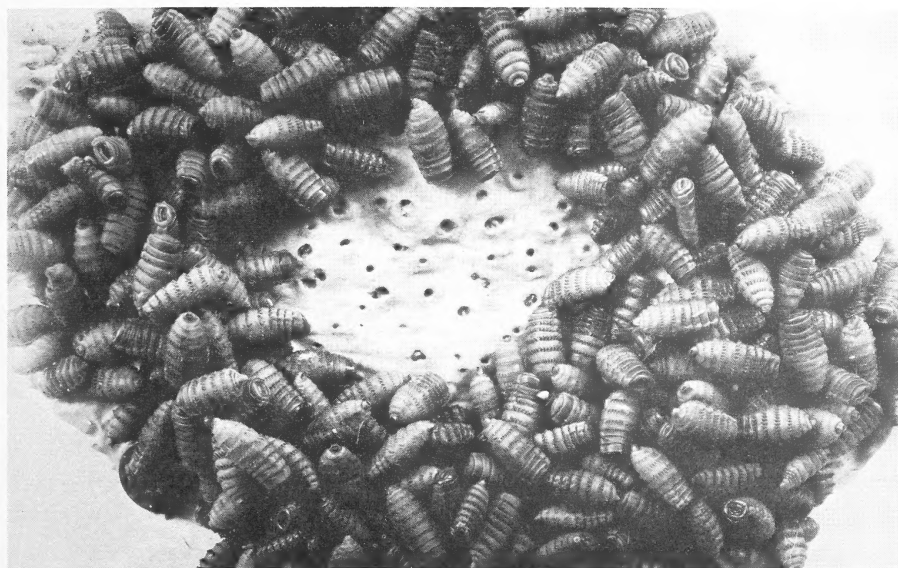
- Early in the fall, make an appointment with a veterinarian to have your animals treated on the desired date.

- Do not feed the animals for 18 hours before they are treated.

The veterinarian may administer carbon disulfide by stomach tube or in gelatin capsules with a balling gun. A horse weighing about 1,000 pounds is given 6 drams of the chemical. Smaller animals are given less. Yearling colts should not receive over 3 drams.

Do not feed or water the animal for 3 hours after the administration of carbon disulfide.

To be most effective, carbon disulfide should be given 1 month after the warm-water treatment described under "External Treatment" (p. 8). During the month between treatments, the bots that were burrowing in the mouth at the time of the warm-water bath will have reached the stomach or the intestines, where the carbon disulfide can kill them.



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Part of a horse's stomach heavily infested with bots. Note the lesions that these bots have caused.

**Precaution: Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.**

**Do not treat horses that are to be slaughtered for food.**

### **External Treatment**

This treatment consists of applying warm water to the animal to hatch the eggs of the common bot fly. The best time to give the treatment is about 30 days after the first frost, when adult bot flies have disappeared—about November in the North and December in the South.

By this time most of the eggs of the throat and nose bot flies will have hatched, and most of their larvae will have passed to the stomach. The animal may still harbor many eggs of the common bot fly, and larvae may be in the tongue. Unless these eggs are destroyed and 30 days are allowed for larvae in the tongue to pass to the stomach, heavy infestations may develop even after the larvae are killed in the internal treatment.

The treatment for destroying common bot fly eggs:

- Heat water to between 115°

and 120° F. If you have no thermometer, test the water with your hand. It should be heated just to the point at which you can keep your hand immersed without discomfort.

- Wet a sponge or cloth thoroughly with the water and rub it firmly over the animal's body where eggs of the common bot fly are seen.

The firm rubbing provides the necessary heat and moisture to hatch the eggs quickly. The newly hatched bots will die soon after they hatch.

### **COMMUNITY CONTROL PROGRAMS**

A number of communities have attempted bot control by a systematic treatment of all donkeys, mules, horses, and colts. In only 1 year, such treatment has greatly decreased the annoyance from bot flies and has improved the health of the animals.

It appears possible to achieve a high degree of control of bot flies by 2 or 3 years of systematic community effort.

To arrange for a community control program, consult your county agent, farm advisor, or veterinarian.

*Prepared by*

**Entomology Research Division  
Agricultural Research Service**

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